Task list. The tasks will be mainly divided between the two Research Assistants, each in charge of a research pipeline. The P.I. will take charge of the mentoring and supervision of the R.A.s, and actively assist with the most critical, methodological parts of the workplan.

Research Assistant - Total Belief Analysis

Year 1. 1: the solution of the restricted version of the total belief theorem, in which the a-priori belief function is indeed a probability measure, in the discrete case;

2: a study of the structure and multiplicity of the solutions to the restricted version of the total belief theorem;

Year 2.

3: full solution to the general total belief theorem in the discrete case, building on the outcome of the restricted case analyzed in 1;

4: the generalization of the obtained results to the case of continuous belief functions: these two will be the main tasks of the P.I. during the second year;

5: comprehensive study of the different conditioning operators in belief calculus, and formulation of a general framework for conditioning;

Year 3. 6: extension of the results on total belief to the other major conditioning frameworks alternative to Dempster’s conditioning;

7: analysis of the links with related approaches, such as marginal extension in Walley’s imprecise probability;

Research Assistant - Example-based Tracking

Year 2.

8: the design and test of different image feature representation in the example-based pose estimation problem, for both conventional and range cameras, exploiting the available equipment at Oxford Brookes;

9: a preliminary testing on the public pose estimation datasets: the results will be fed back to the activities at 1 and 2 to adjust the course of the research if necessary;

Year 3. 11: compare these approaches with more traditional, “precise” Bayesian solutions in order to understand in what situations uncertain modeling is preferable, as a function of the size of the training set;

12: development of an evidential approach to example-based tracking via total belief;

13: tests, mainly conducted by the R.A., on the effectiveness of the evidential tracking approach in all the major scenarios such as gaming, entertainment industry;

Figure 1: GANTT chart of the workplan for both R.A. #1 (in red) and R.A. #2 (in green), over the 3 years of the project. The milestones for the project, listed in the Case for Support, are illustrated here in the context of the various research tasks.